SOUND FACTS

Low Impact Development

Technical Guidance Manual for Puget Sound

Development practices are taking on a striking new look in the Puget Sound region. The *Low Impact Development Technical Guidance Manual for Puget Sound* contains detailed guidance on how best to design, construct and maintain low impact development (LID) practices.

Staff from the Puget Sound Action Team and Washington State University Pierce County Extension developed the manual with help from a broad-based advisory committee, including stormwater staff from the Department of Ecology (Ecology) and numerous professionals in the public and private sectors. Ecology provided grant funding for the project.

Purpose of the manual

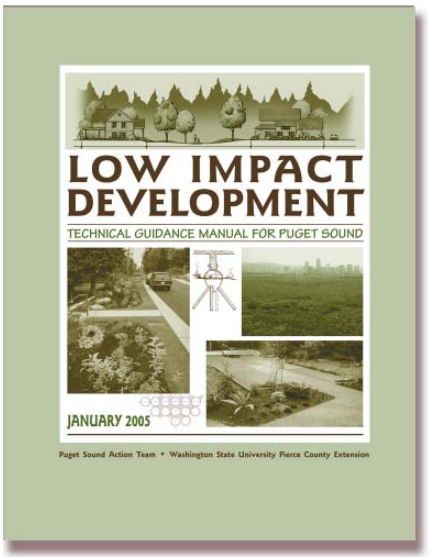
The manual provides professionals involved in stormwater management and land development in the Puget Sound region with a common understanding of LID goals and objectives, site assessment and design methods, credits for reducing the size of conventional stormwater facilities, and specifications for individual practices. In addition, the manual provides findings from national and international research and monitoring data to help professionals make informed decisions when using LID techniques in projects.

The manual is targeted to engineers, planners, developers, builders, architects, landscape architects and other technical staff who design, review, permit and build using LID practices.

Why do we need LID?

Research shows that conventional development practices do not fully protect water quality, fish and wildlife habitat, and other aquatic resources from the adverse effects of development and stormwater runoff. Ecology estimates that of all waters on the state's list of polluted water bodies, about 30 percent of them are polluted because of stormwater runoff.

Pollution from nonpoint (or dispersed) sources, including stormwater runoff, has closed thousands of acres of shellfish growing areas to harvest. Federal agencies cite



Low Impact Development defined

Low impact development is a stormwater management and land development strategy applied at the parcel and subdivision scale that emphasizes conservation and use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely mimic pre-development hydrology.

The goal of LID is to prevent measurable harm to streams, lakes, wetlands and other natural aquatic systems from commercial, residential or industrial development sites.

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Photo courtesy of Seattle Public Utilities

A bioretention swale in Seattle's Broadview Green Grid Project.

loss of habitat due to development and stormwater runoff as one of the factors limiting salmon populations in Puget Sound.

LID practices offer great potential to help our region manage development and stormwater runoff more effectively. The practices can be used in rural, suburban and urban settings, on residential, commercial, municipal and industrial sites. Low impact development can be used in new developments or as part of a redevelopment project.

Initial monitoring shows LID to be effective

Initial findings from monitoring studies in the Puget Sound region indicate that LID practices can be effective. For example, University of Washington researchers monitoring the Street Edge Alternatives project in Seattle found that the innovative street design reduced total stormwater volume by approximately 98 percent since monitoring began in 2000. Other studies from our region and other parts of the nation and Europe show that LID practices can significantly reduce pollutant loadings in stormwater runoff.

Although we have more to learn about LID practices, the *Low Impact Development Technical Guidance Manual for Puget Sound* reflects the region's best thinking to date on these innovative stormwater management techniques.

Organization of the manual

The manual contains eight chapters and nine appendices:

- **Chapter 1** sets the context for LID with an introduction to Puget Sound lowland hydrology, the effects of urban development on water resources, and the goals and objectives for LID.
- **Chapter 2** details how to inventory and assess a site's soils, hydrologic patterns, native vegetation, wetlands, riparian management areas and flood plains.
- **Chapter 3** describes site planning and layout for roads, driveways and parking; street trees; lot layout; and building design.
- **Chapter 4** shows how to protect, revegetate and maintain vegetation on a development site.
- **Chapter 5** offers techniques to minimize site disturbance when clearing and grading.
- **Chapter 6** provides detailed guidance and specifications for six integrated management practices: bioretention areas, soil amendments, permeable pavement, vegetated roofs, minimal excavation foundations and roof rainwater collection systems.
- **Chapter 7** outlines the new credits in the Western Washington Hydrology Model (from Ecology's *Stormwater Management Manual for Western Washington)* that allow engineers to reduce the size of conventional flow control facilities when LID techniques are used.
- **Chapter 8** highlights several emerging techniques to model LID practices.
- **Appendices** include a street tree list, examples of bioretention, bioretention plant list, bioretention research, phytoremediation, phytoremediation plant list, permeable paving research and a sample specification for permeable asphalt.

LID Manual on the Web

To view or download the *Low Impact Development Technical Guidance Manual for Puget Sound* go to the Action Team's web site at: **http://www.psat.wa.gov/Programs/LID.htm**. If you would like to receive a printed copy of the manual, call (360) 725-5444 or (800) 54-SOUND.

For more information on low impact development, contact:

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For more information about the Action Team visit www.psat.wa.gov or call the Action Team at (360) 725-5444 or (800) 54-SOUND.
If you need these materials in an alternative format, call our TDD number: (800) 833-6388.
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